

REMARKS

Claims 21-24 are currently pending, and claims 22 and 23 have been withdrawn from consideration as being drawn to a non-elected invention. Claims 21 and 24 are variously rejected as follows. In view of the arguments below, Applicants respectfully request reconsideration on the merits of the application and allowance of the claims.

Rejections under 35 U.S.C. § 102(a)

Claims 21 and 24 are rejected under 35 U.S.C. § 102(a) as being anticipated by Schumm *et al.* (Inter. Symp. Human Identif., 1993) (“Schumm *et al.*”). Schumm *et al.* is characterized as teaching “a method for rapid and easy interpretation of DNA STR markers,” “a gel [showing] a fluorescein-labeled multiplex of the loci CSF1PO, TPOX, TH01 and vWF” and “a method of simultaneously determining the alleles present at at least three loci, for example HUMCSF1PO, HUMTPOX and HUMVWFA31.” *See* Office Action, page 3.

The authorship of Schumm *et al.* (*i.e.*, James W. Schumm, Ann Lins, Christoph Puers and Cindy Sprecher) differs from the inventive entity of the present application (*i.e.*, James W. Schumm, Cynthia (Cindy) J. Sprecher and Ann M. Lins). Pursuant to 37 C.F.R. § 1.132, Applicants submit herewith a declaration of Cynthia J. Sprecher (“declaration”), in which she attests to the fact that she, Schumm and Lins were co-authors of the Schumm *et al.* publication. As stated in the declaration, the publication describes the work of Schumm, Lins, and Sprecher, and while Mr. Puers, the only co-author on the Schumm *et al.* publication who is not also an inventor on the present application, contributed technical support, he did not make an inventive contribution to the claimed invention.

Thus, in light of the declaration and the arguments set forth above, Applicants respectfully request that the rejection of claims 21 and 24 under 35 U.S.C. § 102(a) be withdrawn.

Rejections under 35 U.S.C. § 103(a)

1. Caskey, Kimpton-I, Kimpton-II, Fregeau and Urquhart

Claims 21 and 24 are rejected under 35 U.S.C. § 103(a) as being obvious over Caskey (U.S. Patent 5,364,759) and Kimpton (Int. J. Leg. Med., 1994) (“Kimpton-I”), in view of any one of Kimpton (PCR Methods and Applications, 1993) (“Kimpton-II”), Fregeau (Bio Techniques, 1993) or Urquhart (Int. J. Leg. Med., 1994). Caskey and Kimpton-I are characterized as teaching or suggesting all of the limitations of claims 21 and 24 except for the specifically claimed combinations of loci. The Examiner alleges, however, that it would have been *prima facie* obvious to modify the teachings of Caskey and Kimpton-I with the disclosures of Fregeau, Kimpton-II or Urquhart to obtain the claimed invention. The Examiner alleges that Fregeau, Kimpton-II and/or Urquhart provides one of skill in the art motivation to choose any reasonable number of loci in desired combinations and implement the multiplex amplification by routine optimization of PCR methodology.

A *prima facie* case of obviousness requires: (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) a reasonable expectation of success; and (3) the reference or combination of references must teach all of the claim limitations. (MPEP § 2142.) The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP § 2143.

Applicants respectfully submit that the references cited fail to combine to teach or suggest all of the limitations of the rejected claims, to provide one of ordinary skill in the art a reasonable expectation of success when combining the teachings of the references that they will result in the methods of claims 21 and 24, and to set forth some suggestion or motivation to modify the references to teach all of the limitations of the rejected claims. More specifically, the references do not combine to teach the specific combination of loci that are selected and co-amplified in claims 21 and 24, provide sufficient guidance as to how one of ordinary skill in the art would reasonably expect to be successful when simultaneously determining the alleles present in at least three or four STR loci by selecting a set of at least three or four STR loci and co-amplifying the set of at least three or two STR loci in a multiplex amplification reaction, or how to modify the references in order to select a combination of loci that will result in a successful combination.

While the Examiner expressly concedes that “[n]either Caskey nor Kimpton specifically teach the combinations of loci recited in the instant claims,” Office Action, page 5, she has not set forth any references that sufficiently cure this deficiency. In fact, the Examiner admits that “[i]n Kimpton the combinations of loci are not identical to the combinations claimed,” *id.* at page 7, and “Urquhart does not . . . teach all of the recited combinations disclosed in the instant application,” *id.* at page 8. Although the Examiner discusses the teachings of Fregeau, no evidence is set forth that Fregeau contains disclosure that sufficiently addresses the inadequate teachings of the other references in order to allow the references to combine to teach all of the claimed loci combinations of claims 21 and 24.

Nevertheless, the Examiner rejects the claimed methods as obvious on the basis that a “skilled artisan would have been motivated by the teachings of Fregeau, Kimpton, or Urquhart to choose any reasonable number of known STR containing loci, and use them in desired combinations for detection and analysis of polymorphisms in STR loci.” *Id.* at page 9. Applicants submit that in order to establish a *prima facie* case of obviousness in light of a combination of references, the references must combine to “teach all of the claim limitations.” Thus, because the Examiner has not set forth references that combine to teach or suggest all of the limitations of claims 21 and 24 (i.e., the specific combination of loci), Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness for these claims.

Moreover, Applicants submit that Fregeau, Kimpton-II and Urquhart fail to provide a reasonable expectation of success when simultaneously determining the alleles present in at least three or four STR loci by selecting a set of at least three or four STR loci and co-amplifying the set of at least three or two STR loci. In fact, the references emphasize the importance of selecting loci that will avoid various difficulties that may arise when performing such a method. For example, one of the two sets of loci identified by Caskey are reported as producing problematic overlapping doublet bands on gel electrophoresis (*see* Caskey, Fig. 3) and Kimpton-II discloses that selection of STR loci is an important consideration as precision may be reduced if less compatible loci are co-amplified together (*see* Kimpton-II, page 16, col. 3 to page 17, col. 1).

Furthermore, none of the references set forth sufficient guidance or any suggestions as to how one skilled in the art would modify the references in order to select a combination of loci that would result in a successful combination. Further, the Examiner's assertion that the references would have motivated one of ordinary skill in the art "to choose any reasonable number of known STR containing loci, and use them in desired combinations for detection and analysis of polymorphisms in STR loci" is unsupported by the disclosures of the references themselves. As set forth above, the references actually disclose that selecting and co-amplifying any number of loci and simultaneously determining the alleles present is difficult.

Based on the arguments set forth above, Applicants respectfully request that the rejection of claims 21 and 24 under 35 U.S.C. § 103(a) be withdrawn.

2. Caskey and GenBank STR loci

Claims 21 and 24 are also rejected under 35 U.S.C. § 103(a) as being obvious over Caskey, in view of GenBank STR loci HUMTH01, HUMTPOX, HUMF13A01, HUMFABP, HUMMYPOK, HUMBFXIII, HUMHPRTB, HSAC04, HUMCYP19 and HUMPLA2A1. Although the Examiner concedes that Caskey does not specifically teach the recited locus combinations, the Examiner asserts that such loci combinations have been disclosed in GenBank, and that even though Caskey teaches that a reaction with HUMARA and HUMFABP alleles appear as widely spaced doublets such that adjacent alleles overlap, different labels may be applied to the different loci to unambiguously identify the alleles. The Examiner concludes that it would have been obvious to one of skill in the art to use any number of primers, including SEQ ID NO:1-32, to accomplish the same goal for the process of simultaneously amplifying specified loci which provide a different pattern and thus, a means of confirmation or subsequent analysis.

Applicants respectfully submit that Caskey and the GenBank STR loci recited above fail to provide one of ordinary skill in the art a reasonable expectation of success when simultaneously determining the alleles present in at least three or four STR loci by selecting a set of at least three or four STR loci and co-amplifying the set of at least three or two STR loci. Applicants assert that it would take undue experimentation by one of ordinary skill in the art to determine, among the vast number of STR loci available to choose from, which combination of STR loci would successfully result in the claimed methods. Moreover, as discussed above,

Caskey fails to provide sufficient guidance to one of ordinary skill in the art on how to select loci which could be amplified to produce results that could be evaluated in any meaningful way.

Thus, Applicants respectfully request that the rejection of claims 21 and 24 under 35 U.S.C. § 103(a) be withdrawn.

3. Schumm-I

Claims 21 and 24 are further rejected under 35 U.S.C. § 103(a) as being obvious over Schumm et al. (U.S. Pat. 5,783,406, 1998) (“Schumm-I”). The Examiner alleges Schumm-I teach all of the limitations of claims 21 and 24 except for a multiplex method for analyzing HUMTPOX, HUMCSF1PO and HUMVWFA31. The Examiner alleges, however, that the “ordinary artisan would have been motivated to expand the assay to other loci taught by Schumm-I to enable further analysis and distinguishment of alleles.” Office Action, page 17. However, as discussed above, successfully selecting STR loci, out of the long list of those available, that can be co-amplified to produce meaningful results would require one of ordinary skill in the art to perform an undue amount of experimentation.

Thus, Applicants respectfully request that the rejection of claims 21 and 24 under 35 U.S.C. § 103(a) be withdrawn.

Double Patenting Rejections

Claims 21 and 24 are rejected for obviousness-type double patenting over claims of U.S. Patent Nos. 6,479,235 (“the ‘235 patent”), 6,221,598 (“the ‘598 patent”) and 5,843,660 (“the ‘660 patent”). The Examiner alleges that although the conflicting claims are not identical, they are not patentably distinct from each other because claims 21 and 24 of the present application are generic to claims 1-3 and 24 of the ‘235 patent, claim 1 of the ‘598 patent and claims 1 and 5 of the ‘660 patent. The ‘235, ‘598 and ‘660 patents each claim priority back to the same application as the present application (U.S. Appl. Ser. No. 08/316,544, now abandoned).

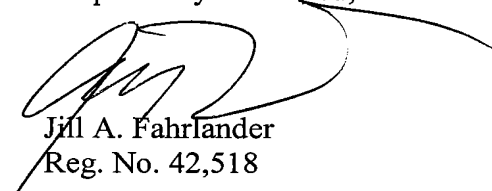
Applicants traverse the Examiner’s rejection of claims 21 and 24 as being obvious over various claims of the ‘235, ‘598 and ‘660 patent. However, in the interest of advancing

prosecution on the merits, Applicants submit herewith terminal disclaimers for the '235, '598 and '660 applications, accompanied by the appropriate fee required under 37 C.F.R. § 1.321.

Based on the foregoing, Applicants respectfully submit that claims 21 and 24 of the present application are now in condition for allowance, and a favorable action thereon is respectfully requested. Should the Examiner feel that any other point requires consideration or that the form of the claims can be improved, the Examiner is invited to contact the undersigned at the number listed below.

The fees for the terminal disclaimers submitted herewith should be charged to Deposit Account No. 50-0842. No additional fees are believed to be due. However, if additional fees are owed, please charge such fees to Deposit Account No. 50-0842.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Jill A. Fahrlander', with a long horizontal flourish extending to the right.

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